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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS

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SUBJECT—

TITLE

FOREST INSECT SURVEY

of the

SIERRA NATIONAL FOREST AND ADJACENT PRIVATE LANDS

SEASON OF 1946

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Season of 1946

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Season of 1946

DEVELOPMENT OF INFESTATIONS IN 1945

Upward trends in bark beetle activity in the pine type were prevalent last year over a large part of the forest. However, with two exceptions endemic conditions prevailed. These exceptions were in the Bass Lake unit and at Black Rock in the Patterson Mountain unit. In each unit killing was heavy and required control measures to suppress bark beetle aggressiveness. At Bass Lake somewhat in excess of 1,000 ponderosa pines had been killed during the summer and about 500 more trees carried overwintering broods. The Black Rock infestation which developed in fire injured trees of the 1943 Black Rock burn resulted in death during the summer of an estimated 2,500 sugar pines and ponderosa pines.

FIELD EXAMINATION 1946

The forest insect survey of the Sierra National Forest was made this year between October 7 and 16 in the principal commercial timber zones, at a cost approximating $350.00. It was undertaken by C. R. Struble of the Berkeley Laboratory and two Forest Service employees, Bruce Drynan and Raymond King. The amount and trends of infestation were determined as a result of measured losses from 17 representative roadside plots, one 320-acre sample plot, and ground strip cruises. The effectiveness of control work carried on during the year was determined as a result of ground strip cruises to sample about 10 percent of the area controlled; this was supplemented by red top counts of currently killed trees.

Areas Examined

Representative samples were taken in all of the pure pine and mixed conifer virgin and cut-over reserve stands lying between the Merced and Kings Rivers. Areas included in this zone which varies in elevation from 3,000 to 7,000 feet are; Chowchilla, Wawona, Willow Creek, Chiquito, Kaiser, Shaver, and Kings River (See map).

Current Insect Trends and Losses

The general loss trend this year was somewhat improved over 1945 in the forest taken as a whole. There were a few units which showed definite increases in activity, but there were no epidemic outbreaks which would demand immediate controlling action. Localized killings of relatively high intensity associated with recent logging activity were to be found in the Jerseydale unit and in certain private lands nearby during the late summer and fall. These outbreaks in groups of thrifty second growth ponderosa pine showed little evidence of continuing damage to other trees. Upward trends were found also in the Soquel and Oak Flat units. The

situation at Bass Lake was greatly improved over a year ago. At Black Rock there was much improvement, particularly in the burned area, but current endemic losses still in the sugar pine-fir type outside the burn are potentially serious.

Insects Involved in Current Kill

In ponderosa pine the pine engraver beetle, Ips confusus figured prominently with the western pine beetle, Dendroctonus brevicomis in the killing of groups of thrifty trees near logging activity at Jerseydale and Miami Mountain, with a few groups containing as many as 100 trees. The Ips - D. brevicomis combination was evident to a lesser extent in the Blue Canyon and Oak Flat units where there was also some group killing. In sugar pine the mountain pine beetle, D. monticolae was responsible for most of the killing of trees scattered through the Soquel, Chiquito, Rock Creek, Dinkey, and Patterson Mountain units. Other insects responsible for some killing in pine were the flatheaded borers, Melanophila gentilis in sugar pine and M. californica in ponderosa pine and Jeffrey pine. In fir the fir engraver beetle, Scolytus ventralis and Sierra fir borer, Tetropium abietis were responsible for considerable killing this year, particularly in white fir.

AREAS REQUIRING SPECIAL ATTENTION

Chowchilla area

Group infestations by Ips confusus and D. brevicomis appeared during the late summer and early fall in the Jerseydale unit and in scattered localities within the lower pine belt as far south as Oakhurst. All of these infestations were found to be associated with logging slash where large Ips populations were reared. Attacks in groups of thrifty second growth trees and poles were very heavy but remained confined to the immediate logging areas. It is expected that this infestation will die out rather suddenly, but the infested areas and surrounding timber zone should be watched closely to detect any evidence of continuing aggressive killing.

Willow Creek Area

Persistent mountain pine beetle attacks in sugar pine were evident in the soquel unit. Heaviest killing occurs in the virgin stands between Fresno Dome and the east slopes of Grays Mountain. These stands contain a considerable number of overmature trees where about 20 of them were killed during the summer. This part of the Soquel unit should be watched closely to note the continuance of aggressive killing. The killing in the reserve stands of Soquel basin proper amounted to occasional scattered single trees.

Kings River area

In the Oak Flat unit there was an appreciable rise in the number of infested ponderosa pines, occurring as small scattered groups and single trees. This situation, while not serious warrants close attention to note any further increases in killing and determine the necessity for control. The number of infested sugar pines in this unit remained about

the same as in 1945.

In the Patterson Mountain unit sugar pine infestations by D. monticolae were increased somewhat over a year ago on the west slopes of the mountain. This is believed to be due in part to an increase in populations built up in fire injured trees of the 1943 Black Rock burn, on the Kings River (north Fork) side. This area should be kept under observation for any further increases in activity.

Chiquito area

Infestations in the Chiquito unit remained at about the same level as in 1945, with slightly upward trends indicated. Sugar pine infestations at Grizzley Meadow were appreciably upward from a year ago. While the volume of trees remained slightly below 1945 at the time of this year's survey, the number was somewhat greater than 1945. Additional 1946 losses are expected to show up later on in the winter. While the situation in this unit is endemic, recognition must be taken of the upward insect trend for any future action that may be required.

RESULTS OF CONTROL WORK

Bass Lake Project

This project covering about 10,500 acres of timber, primarily under government ownership, was undertaken by Forest Service crews between February 25 and April 30, 1946. 1/ Infested trees totalling 191 were treated by felling, peeling, and burning at a cost of $2,048.04 of which $250.00 each was contributed by the California State Division of Forestry and Pacific Gas and Electric Company. A number of trees were treated earlier in the winter by CPS crews in addition to many that were salvaged by a local lumber company which hauled infested logs to its mill in Pinedale. The total number of infested trees treated or salvaged was about 450, most of them ponderosa pine.

The result of this project as determined from roadside counts, roadside plots, and reconnaissance counts in the fall, 1946 indicated a reduction in number of infested trees of close to 95 percent of those current in the fall of 1945. The September, 1945, survey revealed in excess of 1,000 trees killed during the summer and an estimated 500 infested trees carrying overwintering infestations. The survey this year revealed approximately 80 trees killed, 20 of which would carry overwintering infestations in the same area of approximately 10,500 acres.

Black Rock project

This project was undertaken between April 8 and May 15, 1946 in the Teakettle Creek drainage basin to supress an active mountain pine beetle infestation in sugar pine which built up after the 1943 Black Rock burn. Forest Service crews treated by felling, peeling, and burning a total of 92 infested trees with a volume amounting to 496,090 feet b.m. in 1280 acres. 1/

1/ Annual Project Report, Sierra National Forest, October 7, 1946

The results of this work as determined by check strip cruises in unburned timber and in fire injured trees along the burn perimeter during October, 1946 revealed an appreciable reduction in bark beetle activity. The reduction was particularly marked along the edge of the burn where in a 40 acre strip in 1945 there were 38 infested trees, and in 1946 there were 3 infested trees, a reduction of 92 percent. In unburned timber a check strip of 220 acres in 1945 revealed 7 infested trees and in 1946 four infested trees, a reduction of 43 percent. Even with this reduction the current killing within the unburned area, amounting to about 12 trees per section, is still relatively high.

CONTROL RECOMMENDATIONS FOR 1946-1947

No special control projects are warranted on the forest this year, but within the areas requiring special attention certain measures may be taken to reduce the insect hazard.

In the Jerseydale area where Ips infestations were so closely associated with logging slash, much may be done to prevent future outbreaks through the treatment of fresh slash or disposing of it before Ips can establish broods. One of the simplest and relatively inexpensive means of slash treatment is to lop the limbs from all the tops of trees left in the woods, and get the small diameter slash material out into the open where it will dry out rapidly. All currently killed trees of merchantable size, many of which will contain overwintering broods of Ips and D. brevicomis, should be salvaged by local mills. Private owners of timber throughout this lower pine belt should be informed of the logging slash hazards and encouraged to reduce them through early slash treatment.

Some of the bark beetle hazards, particularly in the Soquel, Oak Flat, Blue Canyon, and Patterson Mountain units may be reduced through salvage of infested material by local mills in the vicinity of infestations. Mill operators should be encouraged to log this material before broods emerge in the spring.

Annual maintenance control in the Bass Lake unit within at least one-half mile of the lake shore is recommended as good insurance against aggressive killing in this recreational zone.

TABLE I

SIERRA NATIONAL FOREST

Measured Pine Losses 1945 and 1946

Unit	Plot No.	Acres	Species	Trees Killed 1945 (Complete Record) Number	Volume	BM/AC	Trees Killed 1946 (Partial Record) Number	Volume	BM/AC
			VIRGIN PINE TYPE						
7 McLeod Flat	RD-6	104	PP	53	25390	244	3	570	5
			SP	2	3740	36	1	5740	55
				55	29130	280	4	6310	60
11 Fish Creek	RD-16	360	PP	3	6480	18	2	2070	6
			SP	1	1800	5	1	7290	20
				4	8280	23	3	9360	26
13 Grizzley Mdw.	RD-7	120	PP	0	0	0	1	4240	35
			SP	2	16920	141	3	10080	84
				2	16920	141	4	14320	119
13 Arnold Mdw.	RD-8	176	PP	2	3120	17	7	7740	44
			SP	0	0	0	0	0	0
			JP	3	4990	28	0	0	0
				5	8110	45	7	7740	44
13 Jackass	RD-9	56	PP	2	4810	86	0	0	0
			SP	0	0	0	0	0	0
13 Jackass	RS-9	320	PP	5	15040	47	6	13190	41
			SP	0	0	0	0	0	0
13 Summit Mdw.	Rd-10	232	PP	3	6960	30	4	4400	19
			SP	0	0	0	0	0	0
			JP	0	0	0	0	0	0
15 Stump Sprs.	RD-13	300	PP	4	7060	23	2	4400	15
			SP	0	0	0	2	4510	15
				4	7060	23	4	8910	30
16 Big Creek	RD-12	400	PP	3	12400	31	2	6580	16
			SP	2	800	2	3	8400	21
				5	13200	33	5	14980	37
21 Fence Mdw.	RD-14	520	PP	4	3030	6	17	38570	74
			SP	3	9100	18	5	10370	20
				7	12130	24	22	48940	94

2586 93 12,640 125150

215

TABLE I (Continued)

SIERRA NATIONAL FOREST

Measured Pine Losses 1945 and 1946

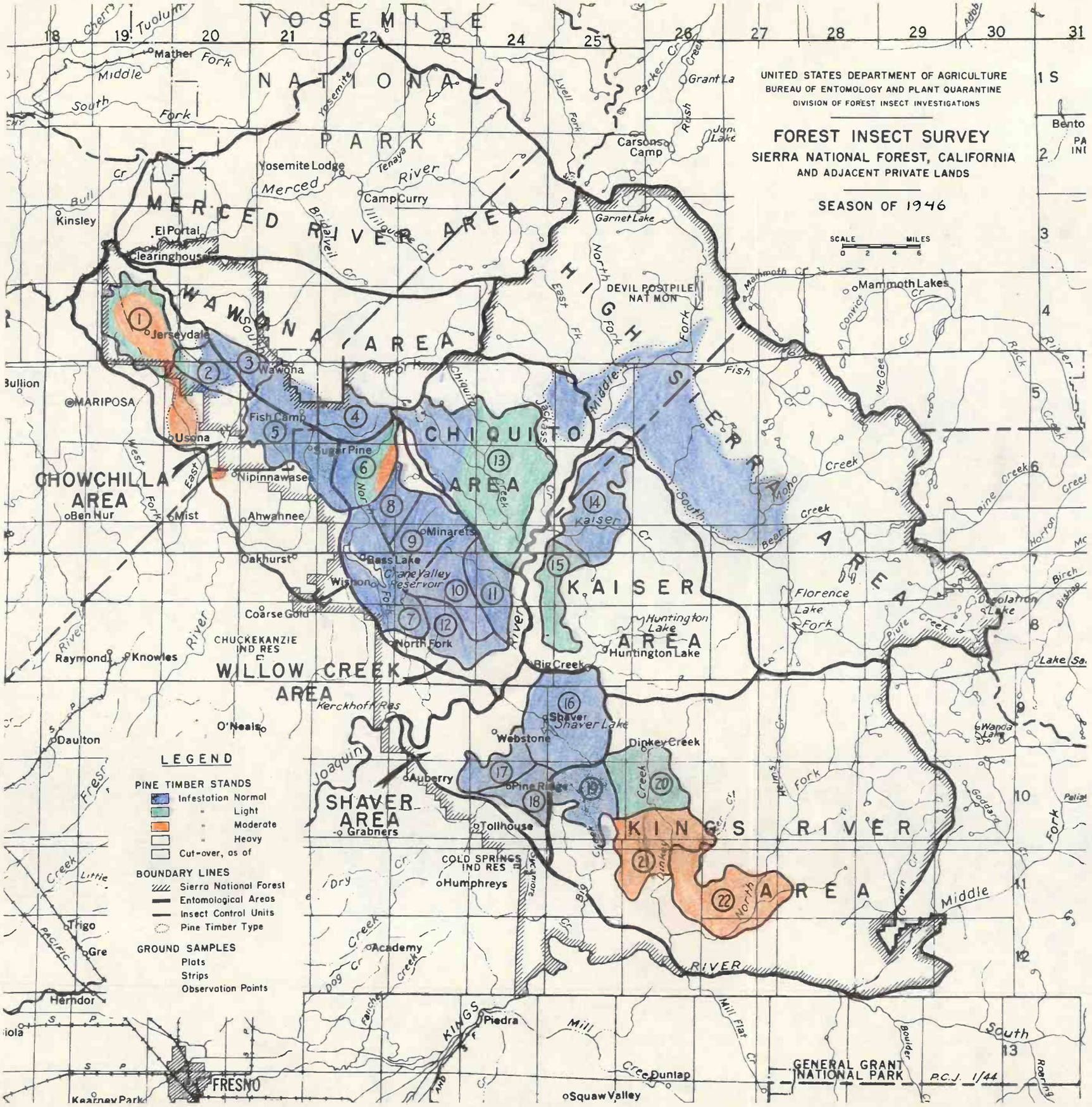
Unit	Plot No.	Acres	Species	Trees killed 1945 (Complete Record) Number	Volume	BM/AC	Trees killed 1946 (Partial Record) Number	Volume	BM/AC
			CUT-OVER RESERVE PINE TYPE						
2 Footman Ridge.	RD-1	424	PP	4	9750	23	5	1860	4
			SP	3	450	1	0	0	0
				7	10200	24	5	1860	4
3 Signal Ridge.	RD-2	504	PP	0	0	0	0	0	0
			SP	2	7560	15	0	0	0
6 Redwood Creek	RD-3	256	PP	0	0	0	0	0	0
			SP	5	8060	35	3	8430	33
6 Kelty Mdw.	RD-4	200	PP	0	0	0	0	0	0
			SP	2	4000	20	0	0	0
6 Soquel	RD-5	120	PP	0	0	0	0	0	0
			SP	1	1680	14	1	3370	28
12 Saginaw	RD-15	384	PP	3	6530	17	17	26860	70
			SP	0	0	0	0	0	0
18 Pine Ridge	RD-11	392	PP	1	80	0.2	0	0	0
			SP	0	0	0	0	0	0
TOTAL	(All Areas)	4868		113	159.750		85	168.670	
				Average		33	Average		34

TABLE II

SIERRA NATIONAL FOREST - 1946

Estimated Bark Beetle Losses During 1946 in Commercial Pine Stands

Unit No.	Name of Unit	Acreage	Trees
	Loss of 10 board feet or less per acre (Normal Infestation)		
3	Signal Ridge	7040	10
12	Cascadel	6400	30
5	Miami (Hugh Ryan)	7200	20
17	Jose Basin	12800	40
18	Pine Ridge	11520	40
4	Fish Camp	13440	10
16	Shaver Lake	21000	90
19	Blue Canyon	14000	200
14	Daulton	22550	200
10	Whiskey Ridge	14080	150
5	Miami (Lewis Creek)	12160	75
9	Sand Creek	16000	20
7	Bass Lake	17920	60
	Loss of 11 to 20 feet BM per acre (Normal Infestation)		
11	Rock Creek	10500	110
8	Chilcoot Creek	5760	90
2	Footman Ridge	3800	40
	Loss of 21 to 30 feet BM per acre (Light Infestation)		
15	Canyon	3800	60
6	Soquel	14080	150
13	Chiquito	48000	400
20	Dinkey Mountain	8330	120
	Loss of 31 to 40 feet BM per acre (Moderate Infestation)		
21	Oak Flat	10240	250
1	Jerseydale	7600	500
22	Patterson Mt.	23680	500
	TOTAL	297810	3165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DIVISION OF FOREST INSECT INVESTIGATIONS
FOREST INSECT SURVEY
SIERRA NATIONAL FOREST, CALIFORNIA
AND ADJACENT PRIVATE LANDS
SEASON OF 1946
SCALE MILES
0 2 4 6
YOSEMITE NATIONAL PARK
MERCED RIVER AREA
WAWONA AREA
HIGH SIERRA AREA
CHIQUITO AREA
CHOWCHILLA AREA
KAISER AREA
WILLOW CREEK AREA
SHAVER AREA
KINGS RIVER AREA
GENERAL GRANT NATIONAL PARK
P.C.J. 1/44
LEGEND
PINE TIMBER STANDS
Infestation Normal
Light
Moderate
Heavy
Cut-over, as of
BOUNDARY LINES
Sierra National Forest
Entomological Areas
Insect Control Units
Pine Timber Type
GROUND SAMPLES
Plots
Strips
Observation Points
Jerseydale
Wawona
MARIPOSA
Fish Camp
Usona
Sugar Pine
Nipinnawasee
Ben Hur
Mist
Ahwahnee
Oakhurst
Bass Lake
Crane Valley Reservoir
Wishon
Coarse Gold
Raymond
Knowles
CHUCKEKANZIE IND RES
Daulton
O'Neals
Auberry
Pine Ridge
Grabners
Tollhouse
COLD SPRINGS IND RES
Humphreys
Academy
Trigo
Herndor
Kearney Park
FRESNO
Piedra
Dunlap
Squaw Valley
Minarets
North Fork
Big Creek
Huntington Lake
Shaver
Shaver Lake
Webstone
Dinkey Creek
Florence Lake
Mammoth Lakes
DEVIL POSTPILE NAT MON
Garnet Lake
Carson's Camp
Yosemite Lodge
Camp Curry
El Portal
Clearinghouse
Kinsley
Bullion
Mather
Grant La
Bento
Lake Sa
Wanda Lake
Desolation Lake
Kerckhoff Res
Kaiser Cr
Middle Fork
South Fork
North Fork
Joaquin River
Merced River
Tuolumne
Yosemite Cr
Tenaya Lake
Tenaya River
Bridalveil Cr
Illilouette Cr
Lyell Fork
Parker Cr
Rush Creek
Mammoth Cr
Convict Cr
McGee Cr
Rock Creek
Pine Creek
Mono Creek
Bear Creek
Horton Creek
Birch Creek
Bishop Creek
Piute Creek
Fish Creek
Chiquito Cr
Jackass Cr
Granite Cr
Dog Cr
Mill Creek
Mill Flat Cr
Boulder Creek
Roaring River
Goddard Cr
Dinkey Creek
Monarch Cr
Crown Cr
Dry Creek
Little Creek
Pacific
Fresno
Kings
Kaiser
Huntington
Florence
Piute
Birch
Bishop
Goddard
Monarch
Crown
Dinkey
Roaring
South
Middle
North
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